REPORT

—ON—

PROPOSED TRAMWAY

—FOR—

The Melbourne, Brunswick, and Coburg Tramway Conference.

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October 25th, 1915.

97-99 Queen-street,
Melbourne, Victoria,
October 25th, 1915.

To the Chairman and Members of

THE MELBOURNE, BRUNSWICK, AND COBURG TRAMWAY CONFERENCE,

Town Hall, Melbourne.

Gentlemen,—In compliance with your honoured instructions, I have prepared the following report on the proposed Electric Tramway in the Municipalities of Melbourne, Brunswick, and Coburg.

ROUTE AND LENGTH OF TRACK.

The route will be up Queen-street from Flinders-street corner to the Melbourne Cemetery, then up Franklin-street to William-street, to Royal Park corner at Flemington-road, via Howard, Courtney and Errol streets, through the Royal Park to McVean-street, Brunswick, along Brunswick-road to Grantham-street, to Pearson-street, taking in a twenty-foot strip of ground belonging to the Hoffman Brick Company in Dawson-street, continuing north along Pearson-street to Moreland-road, reaching this thoroughfare by a westerly deviation from Albion-street to Forbes-street, then along Donne-street, Coburg, to Sussex-street, at the corner of Gaffney-road, this being the proposed northern terminus. A spur track to be built down Moreland-road from Forbes-street, Brunswick, to Sydney-road, the object of this latter being to allow the cars of the system to get along to the car sheds in Moreland-road belonging to the Melbourne, Brunswick and Coburg Tramway Trust.

The total length of road traversed is 8 miles 23 chains 25 links. Of this total 5 miles 3 chains 75 links is double track, and 2 miles 19 chains 50 links is single track, making a total track length of single and double track of 13 miles 27 chains.

The proportion of track mileage in each municipality is:—

Melbourne—6 miles 35 chains.
Brunswick—4 miles 2 chains 50 links.
Coburg—2 miles 69 chains 50 links.

The proportion of track for each municipality, figured on the single track mileage basis, will then be:—

Melbourne	48.3 per cent.
Brunswick	30.2 per cent.
Coburg	21.5 per cent.
	100.0 per cent.

However, working this out on the cost basis, the above figures do not hold, as the two first-mentioned percentages are high, due to this being double track, with the exception of 30 chains in the Brunswick length. On the capital cost the proportion will be:—

Melbourne	46.22 per cent.
Brunswick	28.6 per cent.
Coburg	25.18 per cent.
	100.0 per cent.

NOTES ON ROUTE.

As there has been a great deal of controversy on the question of routes, I think it may not be out of place to discuss the question of the choice I have made, and give some reasons for my decision.

Queen-street was chosen because it is the nearest available street to the centre of the business area, and is in a portion of the city which is becoming progressively more important. The choice between Capel and William streets was dictated by the fact that the Melbourne and Metropolitan Board of Works have more sewers in Capel than in William-street; Courtney-street is the natural conduit for traffic in the occupied area between Flemington-road (one side of which is vacant) and the cable cars in Abbotsford-street.

I have decided to recommend that the track be laid across the Royal Park, both from the point of view that it is the shortest route, and for the benefit of the park itself. (I am aware that it has been impossible to get the consent of the Trustees, but I believe that this objection can be surmounted by an appeal to Parliament through the united action of the citizens.) That the cars will benefit the park there can be no doubt, for I am confident that not two per cent. of the population of the city have ever been in it up to the present. As the Victorian Railways Department have a suburban line through the park, it will be necessary to cross this, and I recommend that this crossing be made under the line at the bank in the vicinity of the back of the Zoological Gardens. This will bring the line along the road adjoining the gardens, so that this institution will be benefited very much by the construction of the line.

The track will leave the park at McVean-street, and pass along this street and Brunswick-road to Grantham-street; this point was chosen because it is in line with the natural route for transportation under the conditions presented. Naturally, if this area was Crown land, then a better route would be had by following a line slightly west of McVean-street, and keeping on a contour which would avoid any grades, and, at the same time, be equidistant between Sydney-road, the existing avenue of traffic, and a future line up the valley of the Moonee Ponds Creek. However, the land is all alienated, and it is necessary to choose the best line available, taking into consideration the grades encountered, and the usefulness of the scheme, both now and in the future, as well as its relationship to the larger system of transportation which will be eventually built to serve the metropolitan area.

It may be argued that the line chosen is considerably closer to Sydney-road than it is to the Creek, and this is undoubtedly a fact, due to two reasons, these being that the greater density of population is on the east side of the line chosen, and this condition will probably continue for all time, and the grades which will be encountered by going further west are a considerable obstacle, and would be a continuous source of expense in the operation of the cars. The greatest disadvantage about placing the line where proposed is that the people who will live (as very few houses are yet built) along the Moonee Ponds Creek will have a greater distance to walk to catch the tram than if it were built further west. If this area was thickly occupied, this would be a matter for serious consideration; but as it is not much built on, and is not likely to be for a considerable time, it is not of much moment.

Not only is the above true of the conditions now, but the situation will be improved with time, because, long before the area is thickly occupied, there will be connecting links running east and west along Dawson-street and Moreland-road and Bell-street to connect up Brunswick and Coburg with Essendon and Footscray, and then the maximum distance between any point in the area and an electric tramway will not exceed six-tenths of a mile, which is a very satisfactory state of convenience. The site chosen for the line through Coburg has been decided upon, as it is almost exactly the centre point between Sydney-road and the edge of the municipality. Of course, in laying out a tramway scheme, the edge of any municipality should not be given much consideration by an engineer if it would be to the detriment of the scheme; but in this case the municipal boundary is a natural one, and hence would divide traffic in any case. It is not impossible that an objection will be urged against endeavouring to make one line accommodate the whole of this area, and not laying the system out to allow for a second line, making two lines west of Sydney-road, as the distance is two miles. In reply to this I would remark that it will be very many years before this area is sufficiently populated to warrant quarter mile transportation conveniences, and there is absolutely nothing to warrant the belief that the future traffic will ever require another set of north and south rails.

The spur proposed between the corner of Donne-street and Moreland-road, along to Sydney-road, will be a convenience to the Coburg people to get to Sydney-road, but the object of constructing it is really to allow the one car shed to do for the two systems, and save the expense of two buildings and staffs. I have not attempted to lay out the scheme to cross Gaffney-street, as I am sure that just now there is nothing to warrant the construction of the line further north, but there will be no difficulty in extending the track from time to time as required.

SYSTEM.

The system proposed is naturally similar to that under construction for the existing Melbourne-Brunswick-Coburg Tramway Trust, consisting of 600 volt direct current overhead line, and standard gauge rails, the tracks being set on 10 ft. centres. Both bogie and single truck rolling stock will be provided, the cars collecting current by means of a trolley from figure 8 copper wire, supported by tubular steel poles in the city, and round wooden poles in the suburbs.

It is not proposed to have a car shed, as a connection is provided between the existing Trust lines along Moreland-road, and this will be effectual in reducing operation expenses. No sub-station will be installed for this line, as power can be had from the Trust's plant at a considerable saving in first cost as well as in operating expenses. Five crossovers will be put in, one at each of the following points:—Queen-street at Flinders-street, Howard-street at Victoria-street, Royal Park at Zoological Gardens, Moreland-road at Donne-street, and Sussex-street at Gaffney-street. A telephone to be placed at each crossover.

The track will be electrically lighted by means of incandescent lamps suspended down the centre, these being lighted from the trolley.

ADMINISTRATION.

I recommend that the proposed undertaking be constructed by a Trust formed from members of the three municipalities interested, and, on its completion, that it be handed over to the existing Melbourne, Brunswick and Coburg Trust to operate, the financial results being settled on a car mileage basis, and paid to, or by, the various councils as found necessary. I have no doubt but that a workable scheme can be settled upon between the two parties interested, and, as soon as the line is in operation, there will be no further work for the above proposed Trust to do, so that they can be disbanded, and the existing Trust will then deal directly with the three councils interested. In this way only one set of officials and offices will be required, and each system will pay its pro rata share of the expense as above-mentioned. Naturally, the two lines would be operated as one unit, and cars would be routed as desired, no distinction being made in the staff or cars which run on either system.

In dealing with the financial returns it will be desirable to keep the results obtained in each municipality separate, as it is not equitable to expect the residents in one portion of the area to pay for the service in another portion. The best method of doing this will be by means of separate tickets for the three municipal districts, and any profit will be handed over to the council in whose area the profit is made, and any loss will be paid out of the municipal funds of the council in whose area the loss occurred.

POPULATION.

The population served by the system can be assumed to be all the people living west of Elizabeth-street and Sydney-road and east of King-street and Abbotsford-street in the city, and Moonee Ponds Creek in Brunswick and Coburg. However, as there will be an efficient Electric Tramway System along Sydney-road, Coburg, it is necessary to deduct a strip twenty chains wide west of this thoroughfare when considering the Coburg figures. As this tramway is largely developmental, the land all being available for immediate settlement, it is perfectly safe to assume that there will be a great deal of building put in hand as soon as the line is decided upon, and in that case the figures quoted herein are not of any great value unless it be that they indicate what the worst possible conditions may be, and that is the excuse for their being presented. I do not assume that they show what the results will be, for I am certain that they will be as much as fifty per cent. better, but in the preparation of a report I endeavour to use the figures as they exist, and indicate in this way what it is possible the future will bring forth.

There can be no question about the fact that, if an engineer had reported that the Prahran-Malvern system would be the success that it has been, it would have had a harmful effect on his reputation at the time as being over-optimistic. Some parallel can

be drawn here between the two areas, and the fact that the number of tenements in Malvern increased by 400 and the valuation by £15,000 in two years after the system was undertaken can be used as an example of what may be expected in Brunswick and Coburg. The increase in the latter areas, in fact, will be a great deal faster, for the system proposed gives a service into the heart of the city, whereas the Malvern system only runs to a shopping area.

The travelling public now living in the area served by the line is as follows:—

COBURG.—2200 people—i.e., all people living west of a line 20 chains west of Sydney-road.

BRUNSWICK.—6250 people—i.e., all people living west of a line running north and south through Gardner-street.

MELBOURNE CITY.—15,000. This figure is made up on a population of 25 per acre for the area served. This is a fair figure for this portion of the city, for in the high buildings in Queen-street it reaches as high as 250 per acre. The average for the whole of the western portion of the city is 9.14, and this includes the abattoirs, sale yards, etc.

CONSTRUCTION.

The whole of the construction work will be of standard type and material, as the conditions do not call for anything else; the permanent way, however, will be more heavily railed in the city than has been necessary in the suburbs, and a concrete foundation will be used on this portion. The current supply system will be overhead line throughout; to suggest the use of a slot and plough system would make the cost prohibitive, and at the same time serve no useful purpose. There may be some feeling against erecting overhead lines in the city streets, but this feeling is unreasonable, when it is remembered that practically every other first-class city in the world has had to allow overhead wires to be erected, the exception being only sufficient to prove the rule. The argument against the slot system, as mentioned above, is largely one of cost, but, in addition, there is a great amount of continually recurring trouble due to short circuits in the tunnel, due to foreign substances and plough trouble, and, as it can only be considered for a comparatively small portion of the area, there is a great deal of time wasted on each trip, due to fixing the plough for the underground section, and removing it for the overhead section.

The cars will be modelled after the type obtained for the existing Northern Trust, so as to minimise the number of spare parts required on the system, although, as the traffic develops, large city type stock will be required, having accommodation for 75 passengers.

PERMANENT WAY.

The track will be laid to the standard 4 ft. 8½ in. gauge, with a distance of 10 ft. centre to centre. In the city, between Flinders and Latrobe streets, the rails will be 100 lb. per yard, while the balance of the scheme will have 90 lb. per yard rails on the straight and 92 lb. per yard rails on curves. The rails in the city section mentioned above will be laid on concrete and grouted in, the other parts being placed on hardwood sleepers, 7 ft. 6 in. by 4½ in. In Coburg, where a single track is proposed, the rails will be laid to one side of the roadway, so that the second track may be placed with a minimum of disturbance to the system.

All rails will be joined by welding, and completely cross-bonded to minimise the voltage drop in the return circuit. The road surface will be finished in plain macadam throughout the whole length, except from Lonsdale to Flinders streets, where mineral asphalt will be used, laid on top of the concrete rail ballast. A set of stone sets will be laid along the rails where the macadam is used, to reduce the wear. Where mineral asphalt is used, no stone sets will be placed. In cases where the streets crossed are wood-paved, this system will be used on the new track. Provision is allowed for effective sub-soil drains for the rock-ballasted track, and by these means the water which gets through the surface will be got rid of without trouble and at a saving in cost.

OVERHEAD LINES.

The overhead lines will be supported by tubular steel poles from Flinders-street to the Royal Park, and by round hardwood poles for the balance of the track. The standard method of galvanised steel strand will be used for supporting the 000 B. & S. figure 8 trolley wire. The poles will be spaced 112 feet apart, and provision has been

allowed for setting all poles in concrete to prevent any displacement due to the one-sided strain. All necessary fittings, such as strain insulators, circuit breakers, etc., have been provided for, as well as a pilot wire from each section. The system will be divided into five sections, with section switch boxes and fuses on each. A parallel system of five 'phones has been allowed for, placed at the feeder section boxes.

The use of wooden poles, as mentioned, will make a considerable difference in the cost of the line, for the difference in price between wooden and steel poles is £6 at the price of each to-day. A further advantage of the wooden poles is that they are readily obtainable, whereas the steel poles have to be imported. There need be no anxiety about the length of life of the wooden poles, for, if ironbark or jarrah timber is obtained, they will last for twenty years at least. It is almost universal practice to use these wooden poles in sparsely settled areas, so that the practice is entirely successful.

FEEDERS.

I have calculated on the use of overhead cable feeders from the Moreland-road substation. These feeders will be carried on the Melbourne, Brunswick and Coburg Tramway Trust's poles to the proposed line, then north and south along the line to the feeder points. The size of feeders proposed are .475 sq. in., .35 sq. in., .275 sq. in., .2 sq. in., and No. 00 B. & S., and will consist of double braided stranded copper. No suggestion is made for the placing of the feeders underground, as this is unnecessary expense. As there will be some considerable congestion of traffic at the city end of the line at a later date, due to the expansion of the system, it will be necessary to install negative feeders to this portion, but no provision has been made for this service here, as the traffic will not warrant it for a considerable time, owing to the use of large section rails. The price of the feeders included in the capital cost has been figured on copper at £70 per ton, instead of its present price of approximately £85. This is quite legitimate, for the London price of copper is now about £72.

STREET LIGHTING.

In the area north of Flemington-road the track will be illuminated by means of ½-watt incandescent lamps, suspended along the centre of the road. These will be lighted from the trolley wire, and will form a cheap and effective system of lighting. As the tramway authority will obtain some revenue from the municipalities for this service, it will be well repaid for this expenditure, and also the area will be much benefited by the lighting service. It is proposed to have ten lights in series, and each group controlled by a separate switch.

POST OFFICE AND ELECTRIC LIGHT WIRES.

The construction of the overhead lines will interfere somewhat with the Postmaster-General's departmental lines, as well as the Melbourne and Brunswick Councils' lines. However, this is not as serious a matter to-day as it would have been a few years ago, owing to the greater portion of the lines for these services being underground. Where the municipalities have lines erected, it is much to be desired that these lines be placed on the tramway poles, for this has the effect of reducing the number of poles in the streets, and thereby reducing the maintenance costs and improving the appearance of the area. As the existing electric light poles are available for use elsewhere, this is an advantage to the Electric Light Department, and a small rental charge can be had for the service. The Post Office Department is not likely to use the tramway poles for their service, as the tendency in this service is to use lanes and right-of-ways, or place their lines underground. The cost of the alterations will be charged by the various authorities to the tramway, and I have included these costs in the totals.

ROLLING STOCK.

To start the scheme under the conditions outlined earlier in this report, it will only be necessary to obtain eight cars of the single truck type, for these will be sufficient to maintain a five minutes' service on the double track portion of the system, and a seven and a half minutes' service on the single track northern portion. No reserve cars are necessary, as the existing Trust is making provision for some spares, and, as the two systems will be operated together, there is no reason for going in for a double set of stand-by cars. Naturally, as traffic increases, it will be necessary to run a faster service than the one proposed, but for most purposes it will be found that the five minute intervals are sufficient. The car proposed for the line is similar to that purchased by the existing Trust, but I am confident that these will be augmented by large cars later on, as the tendency is towards heavy rolling stock with high powers. The advantage at this time of purchasing the small cars is that it lessens the amount of money required to be tied up in spares if all the cars in the shed are similar.

The eight cars running on the proposed schedule will carry 11,850 passengers per day, equivalent to 1481 passengers per car per day; their full capacity is 4320 passengers per car per day.

On the time-table proposed with the number of cars, the total car miles per year will be 350,000 car miles, or an average of 960 car miles per day, which is an average of 120 miles per car per day, which, with the absence of heavy grades or rough service, is a comparatively easy service.

SOURCE OF POWER.

The power supply for the system will be had from the existing Trust's sub-station, where ample power is installed, and all provision made for extending as required. The fact that this power is available simplifies the scheme materially, and makes the proposal much more attractive than if a separate sub-station had to be erected.

The demand for power can be kept on each feeder, and the costs figured therefrom if necessary, although this report is based more on the assumption that the new line will be treated as part of the existing system, and the charges made on a car mileage basis.

CAR-SHED AND OFFICES.

The same thing applies to this portion of the scheme as for the sub-station part. There is ample room provided in the building in Moreland-road for the accommodation of the cars proposed, so that no money is required for the erection of extra buildings. The office and repair space is ample and of good design, so that the proposed system is fortunate in this respect. No pro rata cost has been provided or other cash allowances made for this advantage, but this is a thing that the existing Trust will take into consideration when making the operation agreement.

SECTIONS AND TIME TABLE.

The number of sections proposed for the line is four, the section termini being at Victoria and Howard streets, Park-street at McVean-street, Moreland-road and Donne-street, and Sussex-street at terminus, also corner Sydney and Moreland roads.

This means a through fare of 4d. from terminus to terminus, and sections of 1.109 miles, 2.109 miles, 1.825 miles, 2.494 miles, and 0.75 miles' length. Average distance per 1d. fare equals 1.857 miles.

From the foregoing it will be seen that there are two sections much longer than the other two, but this is not particularly unsatisfactory, and the fact that the ends of the sections are also the municipal boundaries in two cases is an advantage. The average length of the sections is longer than is charged at other places, but this will have a beneficial effect on the district, as it is the fact that the Tramway and Omnibus Company made cheap fares to Brunswick that built up that area so densely. The long section in the Melbourne City area is largely through the Royal Park, and it would be undesirable to break the section in this area. The Coburg section is the longest of any, for the reason that it would be undesirable to make two sections of it, and at the same time, if the Brunswick section were extended farther to the north, it would make this section considerably longer than the average, and much longer than is warranted on the service.

TIME TABLE.

The time-table proposed, and on which the calculations of traffic have been based, is for a maximum service of five minute intervals during the busy hours on the double track portion of the system, and seven and a half minute service on the single track part. This will mean 0.83 miles of double track per car, and will probably require augmenting before the system is very old. The single track portion in the north will have one car to each 1.247 miles of track.

The cars will be despatched over the double track on the following schedule:—

5 minute service	from	7	a.m.	until	9.15 a.m.
5 minute service	from	5	p.m.	until	8 p.m.
10 minute service	from	9.15	a.m.	until	5 p.m.
10 minute service	from	8	p.m.	until	11.30 p.m.
15 minute service	from	6	a.m.	until	7 a.m.

On the single track the same hours will be applied to a seven and a half minute and 15 minute service. As before stated, this will provide a service of 350,000 car miles per year.

CAPITAL COST.

55 chains of city double track in concrete with heavy rails	£10,260	
348.75 chains of double track on crushed rock	48,800	
259.5 chains of single track on crushed rock	22,300	
Special work, including crossovers and junction at Moreland-road	1,400	
Railway subway in Royal Park	4,500	
Total permanent way		£87,260

ALTERATIONS TO SEWER, GAS AND WATER MAINS.

Metropolitan Gas Company	£350	
Melbourne and Metropolitan Board of Works	650	
1067 chains of overhead work with feeders	19,190	
Alterations to lines of G.P.O. Dept., M.C.C., and B.C.C. (£100, £300, £250 respectively)	650	
Electric lighting of track	300	
Eight cars at £1250	10,000	
Land purchase	500	
Sundries and engineering	5,000	
		£36,640
Total		£123,900

REVENUE PER YEAR.

In attempting to estimate the revenue per year which may be expected from a tramway system, it is necessary to make an examination of the area to find out the habits of the people from a travelling point of view. In a report prepared by me previously, I found that the Coburg people made 117.5 trips per head per year on the horse cars, and I estimated that for the then proposed scheme this number would increase to 148. This number was made up of people travelling to Sydney-road and to the city. In this case there will be the same attraction for the people in the area served to ride to Sydney-road (via Moreland-road), and the route to the city will be the most direct possible, offering increased inducement to go by electric tramway. These conditions have weighed with me in causing me to anticipate that the line will have a rather greater amount of patronage than that proposed for East Brunswick, and has induced me to figure on an increased number of trips per head per year. The number I assume now for Coburg for the area served is 150. The population of the area served at present is 2200, and the average fare per trip I calculate to be 2.75 pence per trip.

In Brunswick the traffic will be mainly to and from the city, for the area to the north is too lightly settled to cause much inter-suburban traffic. The proposed line will offer the quickest means of transportation between the City of Brunswick and Melbourne, or to the southern suburbs, and, on that account, will be very largely patronised during the whole of the traffic hours, on account of its superior connection with the City of Melbourne over that offered by the eastern line. I have no hesitation in predicting that the amount of traffic per head will be denser than will be found on the other system, and, if the population of the two areas was equal, there can be no doubt as to which would be the better scheme.

The population which can at present legitimately be claimed for the line is very much less, so that it will be some time before the western line will be as good a proposition as the one now under construction. The trips per head of population which I count on for this section are 140, and the population served by the line 6250 people. The average fare for this area will be 2.1 pence. If this line was through a well built over area, then the average fare would be less, for the line would be used more largely for local traffic, but as it is the great proportion of the traffic will be between Brunswick and the city itself.

The city section of the proposed undertaking is by far the most attractive, due to the greater density of population on this portion. In calculating the population I have endeavoured to take into consideration all of the factors encountered, and to treat them on a straight daily population basis. This means that for revenue purposes it is only necessary to determine the length of the average ride to find out the revenue per year when the trips per head per year are known. For a scheme traversing an area

which is both professional, manufacturing, and residential, the number of trips to be expected for the population calculated upon will be very nearly an average of what is to be expected from combining the figures of each. The average figure I estimate to be 160 trips per head per year, and the average fare 1.2 pence per trip.

The yearly revenue to be expected on the above calculations will be:—

Coburg—2,200 passengers, 150 trips at 2.75d. equals	£3,781
Brunswick—6,250 passengers, 140 trips at 2.1d. equals	7,656
Melbourne—15,000 passengers, 160 trips at 1.2d. equals	12,000
	£23,437

This is equivalent to a revenue of 19/1½ per head of the population served, and is at the rate of 15.5 pence per car mile, which figures are low compared with city service elsewhere, but should be correct for the first few years of operation here.

EXPENDITURE FOR YEAR.

The operating expenditure per year for this line will be similar to that for the existing Melbourne, Brunswick and Coburg Tramway Trust. No figures are available yet on this system, but it is very generally believed that this scheme will show very low figures for operation and maintenance. In my report, submitted previous to the Melbourne City Council's embarking on this scheme, I estimated that the figure would be 9d. per car mile, and I intend to use this figure again for this system here proposed.

As I have indicated that the system should be placed in the hands of the existing Trust to operate, I suggest that the financial arrangement to be entered into between the proposed and the existing Trust be that the councils interested indemnify the Trust against loss on a car mileage basis, and, in the event of any profit, that this be divided in proportion to the number of car miles run. I believe that this basis is a fair one, and that it will be found satisfactory to all parties.

The total annual cost of operating the tramway will then be:—

OPEARATING CHARGES.

350,000 car miles at 9d. equals	£13,125

FIXED CHARGES.

Interest at 5 per cent. on £123,900 equals	£6,195
Depreciation at 2½ per cent. on £123,900 equals	3,097
Sinking Fund at 1½ per cent. on £123,900 equals	1,858
Total	£11,150

Grand total £24,275

After paying away the above amounts, it will be seen that there is a loss per year of £24,275, less £23,437, equal to £838 per year.

On a car mileage basis in each municipality the operating charges will be:—

Coburg—87,500 car miles x 9d. equals	£3,280
Brunswick—100,500 car miles x 9d. equals	3,770
Melbourne—162,000 car miles x 9d. equals	6,075
	£13,125

On a track mileage cost the fixed charges will be:—

Coburg—.2513 x £11,150 equals	£2,785
Brunswick—.286 x £11,150 equals	3,165
Melbourne—.4622 x £11,150 equals	5,200
	£11,150

Then, using these figures, the cost per year in each municipality will be:—

Coburg—£3,280 plus £2,785 equals	£6,065
Brunswick—£3,770 plus £3,165 equals	6,935
Melbourne—£6,075 plus £5,200 equals	11,275
	£24,275

FINANCIAL RESULTS IN EACH MUNICIPALITY.

	Revenue.	Expenditure.	Loss.	Profit.
Coburg	£3,781	£6,065	£2,284	—
Brunswick	7,656	6,935	—	£721
Melbourne	12,000	11,275	—	725

Gross loss, £838.

CONCLUSION.

In preparing the above matter, both letterpress and figures, I have endeavoured to treat the matter entirely as an engineering problem, as it exists to-day. I have in all cases taken the low figure when using two methods to calculate the traffic or revenue, and have checked up the capital carefully, so that this estimate would not be on the low side. I have every confidence in the figures supplied, and believe that they represent the very minimum of what can be legitimately expected from the scheme.

The route proposed for the track is shown in the accompanying map.

Any further information which may be desired by the conference on this matter will gladly be supplied as portion of the report.

Thanking you for your commission,

I have the honour, Gentlemen,

To be, yours obediently,

VALENTINE J. CROWLEY, A.A.I.E.E.

APPENDIX TO REPORT ON WEST BRUNSWICK TRAMWAY.

As the question will be raised as to the route if the Royal Park cannot be used, I wish to state that then the next best proposal is to take the line up Flemington-road to Southgate-street, up to Manningham-street, and north to Park-street, and east along Park-street to an extension of Grantham-street.

This is longer than the route advocated by me by 73.5 chains, and will increase the capital cost by £10,850.

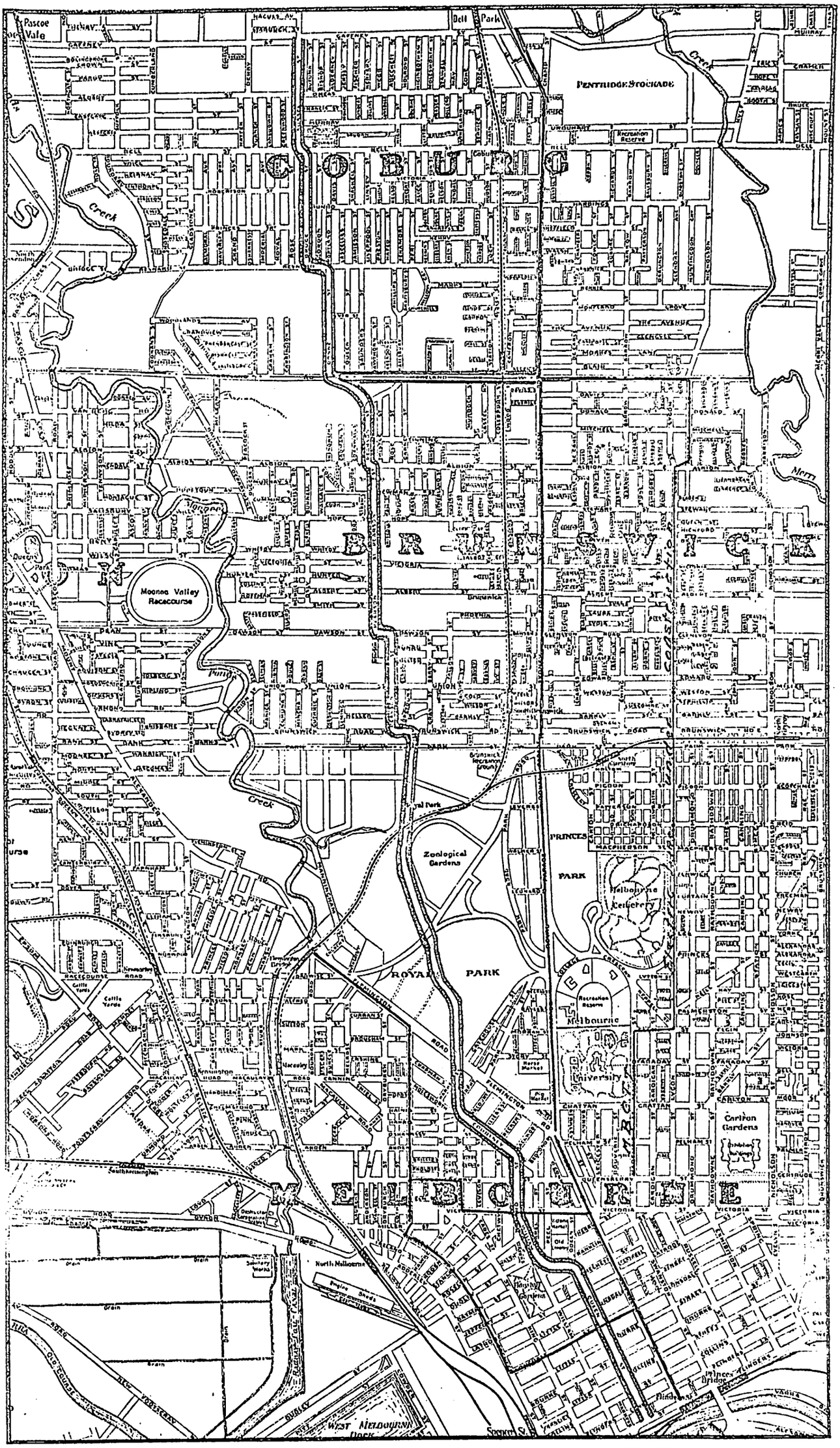
This will increase the annual expenditure by £976, which will increase the gross loss per year from £838 to £1814. This does not cover the entire loss, as there will be the additional car mileage costs, which will bring the total loss up to £2000 per year.

Not only will this extra loss be incurred, but the attractiveness of the scheme will be lessened, and the opportunity to make the Royal Park a real playground for the people will be lost.

I strongly urge the claims of the route proposed, and believe that united action before Parliament by the municipal councillors, as representatives of the best interests of the city, would ensure permission being obtained by Act of Parliament.

Yours obediently,

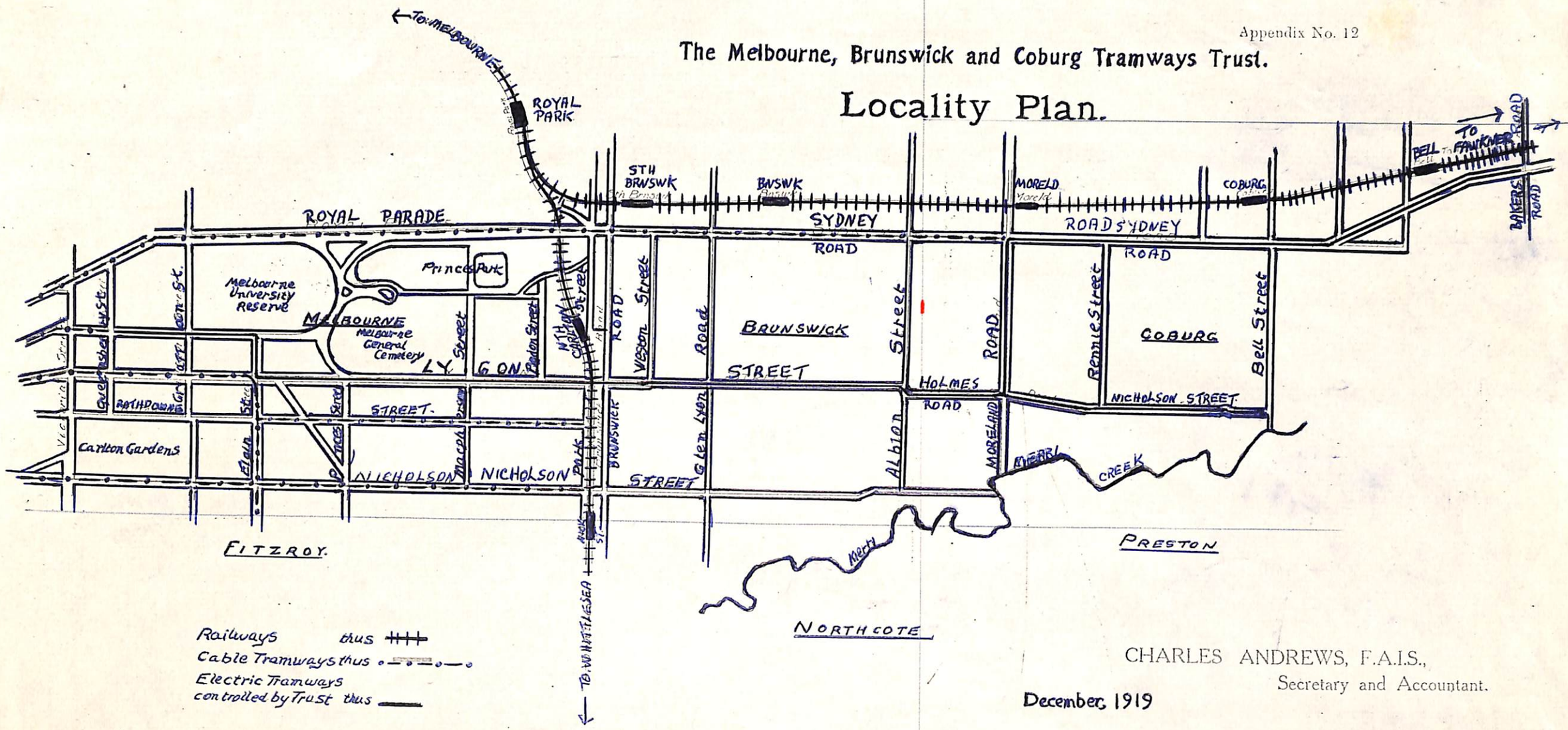
VALENTINE J. CROWLEY, A.A.I.E.E.



McEwan, Stephens & Stillwell, Printers.

The Melbourne, Brunswick and Coburg Tramways Trust.

Locality Plan.



Railways thus ++++

Cable Tramways thus ·—·—·—·

Electric Tramways controlled by Trust thus ———

CHARLES ANDREWS, F.A.I.S.,
Secretary and Accountant.

December, 1919